REMARKS

The Office Action mailed December 1, 2003 has been carefully reviewed and the foregoing amendment and following remarks are made in consequence thereof.

Claims 1-2, 4-11, and 13-20 are now pending in this application. Claims 1-20 stand rejected. Claims 3 and 12 have been canceled.

The rejection of Claims 10, 11, and 13-20 under 35 U.S.C. § 112 first paragraph is respectfully traversed.

Applicant respectfully submits that Claims 10, 11, and 13-20 satisfy Section 112, first paragraph. Claims 10, 11, and 13-20 are rejected under Section 112 as being "single means claims." Applicant does not believe that this rejection is properly applied to Claims 10, 11, and 13-20 because Claims 10, 11, and 13-20 are not recited in "means-plus-function" language. Specifically, Claim 10 recites "[a] circuit...configured to monitor...." As such, Claims 10, 11, and 13-20 are recited as a structure configured according to a claimed limitation, which is not in means-plus-function format. A "circuit" is a structure and a circuit can be configured to fulfill a requirement. However, in an effort to expedite the prosecution of the present patent application, Applicant has amended independent Claims 10 and 20, and dependent Claims 11-19. Claims 11 and 13-19 depend from independent Claim 10. Accordingly, Applicant submits that Claims 10, 11, and 13-20 satisfy Section 112, second paragraph.

For the reasons set forth above, Applicant respectfully requests that the rejection of Claims 10, 11, and 13-20 under Section 112, first paragraph, be withdrawn.

The rejection of Claims 10-20 under 35 U.S.C. § 112 second paragraph is respectfully traversed. Applicant respectfully submits that, Claims 10, 11, and 13-20 are recited as a structure configured according to a claimed limitation. Applicant respectfully submits that one skilled in the art, after reading the specification in light of the Figures, including a schematic diagram, would understand the metes and bounds of a circuit configured as claimed in the present claims. However, in an effort to expedite the prosecution of the present patent application, Applicant has amended independent Claims 10 and 20, and dependent Claims 11-19. Claims 11 and 13-19 depend from independent Claim 10.

Applicant therefore respectfully submits that Claims 10, 11, and 13-20 meet the requirements of Section 112, second paragraph.

Accordingly, Applicant respectfully requests that the rejection of Claims 10, 11, and 13-20 under Section 112, second paragraph, be withdrawn.

The rejection of Claims 1, 2, 4-11, and 13-20 under 35 U.S.C. § 102(b) as being anticipated by Allos (U.S. Pat. No. 4,707,760) is respectfully traversed.

Preliminarily, Applicant wishes to respond to the response to arguments section of the Office Action. The Office Action states, "the transformer T1 provides an approximate 12 volt r.m.s. output," then makes the assertion "it is inherent that the mains voltage in which being monitor by the voltage regulator is rms voltage." This should not be an issue, as the root mean square of an AC voltage may be calculated and a circuit may be configured to output a voltage signal proportional to the root mean square of an AC voltage. Applicant respectfully submits that Allos does not monitor the root mean square of the line voltage to detect a high rms voltage condition. Rather, in contrast to the present invention, Allos uses the sine wave characteristics of a constantly varying voltage that includes a peak voltage level to determine when the peak voltage level exceeds a high level threshold. The peak voltage level is the amplitude of the voltage at a local maxima of the constantly varying sine wave.

Moreover, Applicant respectfully disagrees with the assertion made in the Office Action that "the peak voltage" referred in Allos is no different then the "high and low" rms voltages of applicant." The peak voltage of the constantly varying AC sine wave that is used in the Allos technique is very different than the high and low rms voltages claimed in the present invention. As is known in the art, for a sine wave, the root mean square of the sine wave voltage is a DC equivalent voltage that can be calculated to be 70.7% of the peak voltage level of the sine wave. Allos describes using the constantly varying AC sine wave to trigger a multivibrator when the peak AC voltage exceeds the low-level voltage limit. The present invention does not use this technique but, rather uses the DC equivalent voltage (rms), which is not constantly varying, to monitor the line voltage. As such, Applicant respectfully submits that Allos does not describe the invention claimed in the present invention, and for at least those reasons requests the section 102 rejection of Claims 1, 2, 4-11, 13-20 be withdrawn.

Further, Allos describes a mains protection device for AC mains including a voltage supply circuit (1), a voltage comparison circuit (2), a control circuit (3), and an output and status display circuit (4). In normal operation, the device detects when the peak of the instantaneous value of alternate half cycles of the mains goes outside a predetermined range to provide a first signal state, i.e. a high condition at the output of NAND gate IC3N. When the peak value subsequently returns within range, multivibrator IC4R acts as a one minute timer to produce a second signal state (a low state at the output of NAND gates IC3N) at the end of that period if the peak remains within range.

Claim 1 recites a method for protecting an electrical device, the method comprising the steps of "monitoring a line rms voltage to detect a high voltage condition such that the rms voltage is above a predetermined voltage range...monitoring the line rms voltage to detect a low voltage condition such that the rms voltage is below the predetermined range...electrically isolating the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected...restoring power to the electrical device when the line rms voltage returns to within the predetermined voltage range."

Allos does not describe or suggest a method for protecting an electrical device wherein the method comprises monitoring a line rms voltage to detect a high voltage condition such that the rms voltage is above a predetermined voltage range, monitoring the line rms voltage to detect a low voltage condition such that the rms voltage is below the predetermined range, electrically isolating the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected, and restoring power to the electrical device when the line rms voltage returns to within the predetermined voltage range. Moreover, Allos does not describe or suggest monitoring a line rms voltage to detect a high voltage condition such that the rms voltage is above a predetermined voltage range and monitoring the line rms voltage to detect a low voltage condition such that the rms voltage is below the predetermined range. Additionally, Allos does not describe or suggest monitoring a line rms voltage. Rather, in contrast to the present invention, Allos describes at column 2, lines 57-59 (emphasis added), "[i]n such normal operation, during evey (sic) a.c. cycle the voltage of the cycle will exceed the low-level voltage limit on the lower voltage comparator, IC2D." At column 2, lines 65-67, Allos also recites, "[a]s the multivibrator IC4L is re-triggered every ac cycle (20 ms for

50 Hz) the output "Q1" is maintained in a logic 1 state." Further at column 3, lines 5-6, Allos recites, "[t]he window might be set at .+-.5% to .+-.15% of the peak rated value for the mains." Moreover at column 4, lines 10-18, "the described embodiment detects when the peak of the instantaneous value of alternate half cycles of the mains goes outside a predetermined range to provide a first signal state...[w]hen the peak value subsequently returns within range, multivibrator IC4R acts as a one minute timer to produce a second signal state." Clearly the technique used by Allos does not use the root mean square of the voltage to determine when the line voltage reaches a high or low voltage state. Accordingly, Allos describes the operation of a circuit that operates using the sinusoidal characteristics of the supply voltage, and does not describe nor suggest using the rms characteristics of the supply voltage. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Allos.

Claims 2-9 depend from independent Claim 1. When the recitations of Claims 2-9 are considered in combination with the recitations of Claim 1, Applicant submits that dependent Claims 2-9 likewise are patentable over Allos.

Claim 10 recites a controller circuit for protecting an electrical device wherein the controller circuit includes an integrated circuit coupled to a relay, and the controller circuit includes "a circuit configured to monitor a line rms voltage to detect a rms voltage above a predetermined voltage range...a circuit configured to monitor the line rms voltage to detect a rms voltage below the predetermined range...a circuit configured to electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a rms voltage above the predetermined voltage range and a rms voltage below the predetermined range is detected...a circuit configured to restore power to the electrical device when the line rms voltage returns to within the predetermined voltage range."

Allos does not describe or suggest a controller circuit for protecting an electrical device wherein the controller circuit includes an integrated circuit coupled to a relay, and the controller circuit includes a circuit configured to monitor a line rms voltage to detect a rms voltage above a predetermined voltage range, a circuit configured to monitor the line rms voltage to detect a rms voltage below the predetermined range, a circuit configured to electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a rms voltage above the predetermined voltage range and a rms voltage below the predetermined range is detected, and a circuit configured to restore

power to the electrical device when the line rms voltage returns to within the predetermined voltage range. Moreover, Allos does not describe or suggest a circuit that is configured to monitor a line rms voltage. Rather, in contrast to the present invention, Allos describes at column 2, lines 57-59 (emphasis added), "[i]n such normal operation, during evey (sic) a.c. cycle the voltage of the cycle will exceed the low-level voltage limit on the lower voltage comparator, IC2D." At column 2, lines 65-67, Allos also recites, "[a]s the multivibrator IC4L is re-triggered every ac cycle (20 ms for 50 Hz) the output "Q1" is maintained in a logic 1 state." Further at column 3, lines 5-6, Allos recites, "[t]he window might be set at .+-.5% to .+-.15% of the peak rated value for the mains." Moreover at column 4, lines 10-18, "the described embodiment detects when the peak of the instantaneous value of alternate half cycles of the mains goes outside a predetermined range to provide a first signal state...[w]hen the peak value subsequently returns within range, multivibrator IC4R acts as a one minute timer to produce a second signal state." Accordingly, Allos describes the operation of a circuit that uses the sinusoidal characteristics of the voltage supply to function and does not describe nor suggest rms characteristics of the voltage supply to function. Accordingly, for at least the reasons set forth above, Claim 10 is submitted to be patentable over Allos.

Claims 11-19 depend from independent Claim 10. When the recitations of Claims 11-19 are considered in combination with the recitations of Claim 10, Applicant submits that dependent Claims 11-19 likewise are patentable over Allos.

Claim 20 recites a circuit for protecting an electrical device wherein the controller circuit includes an integrated circuit coupled to a relay, and the controller circuit includes "a circuit configured to monitor a line rms voltage to detect a high voltage condition such that the voltage is above a predetermined voltage range...a circuit configured to monitor the line rms voltage to detect a low voltage condition such that the voltage is below the predetermined range...a circuit configured to electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected...a circuit configured to monitor the line rms voltage after electrically isolating the electrical device to detect a voltage within the predetermined range...a circuit configured to restore power to the electrical device when the line rms voltage is detected to be within the predetermined voltage range...a circuit configured to provide a visual indication when a low voltage condition is detected...a circuit

configured to provide a visual indication when a high voltage condition is detected...a circuit configured to provide a visual indication when the line voltage is being tested."

Allos does not describe or suggest a circuit for protecting an electrical device wherein the controller circuit includes an integrated circuit coupled to a relay, and the controller circuit includes a circuit configured to monitor a line rms voltage to detect a high voltage condition such that the voltage is above a predetermined voltage range, a circuit configured to monitor the line rms voltage to detect a low voltage condition such that the voltage is below the predetermined range, a circuit configured to electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected, a circuit configured to monitor the line rms voltage after electrically isolating the electrical device to detect a voltage within the predetermined range, a circuit configured to restore power to the electrical device when the line rms voltage is detected to be within the predetermined voltage range, a circuit configured to provide a visual indication when a low voltage condition is detected, a circuit configured to provide a visual indication when a high voltage condition is detected, and a circuit configured to provide a visual indication when the line voltage is being tested. Moreover, Allos does not describe or suggest a circuit that is configured to monitor a line rms voltage. Rather, in contrast to the present invention, Allos describes at column 2, lines 57-59 (emphasis added), "[i]n such normal operation, during evey (sic) a.c. cycle the voltage of the cycle will exceed the low-level voltage limit on the lower voltage comparator, IC2D." At column 2, lines 65-67, Allos also recites, "[a]s the multivibrator IC4L is re-triggered every ac cycle (20 ms for 50 Hz) the output "Q1" is maintained in a logic 1 state." Further at column 3, lines 5-6, Allos recites, "[t]he window might be set at .+-.5% to .+-.15% of the peak rated value for the mains." Moreover at column 4, lines 10-18, "the described embodiment detects when the peak of the instantaneous value of alternate half cycles of the mains goes outside a predetermined range to provide a first signal state...[w]hen the peak value subsequently returns within range, multivibrator IC4R acts as a one minute timer to produce a second signal state." Accordingly, Allos describes the operation of a circuit that uses the sinusoidal characteristics of the voltage supply to function and does not describe nor suggest rms characteristics of the voltage supply to function. Accordingly, for at least the reasons set forth above, Claim 20 is submitted to be patentable over Allos.

For at least the reasons set forth above, Applicant respectfully requests that the Section 102 rejection of Claims 1, 2, 4-11, and 13-20 be withdrawn.

The rejection of Claims 1, 2, 4-11, and 13-20 under 35 U.S.C. § 102(b) as being anticipated by Bello et al., "Bello" (U.S. Pat. No. 4,584,623) is respectfully traversed.

Preliminarily, Applicant wishes to respond to the response to arguments section of the Office Action. The Office Action states that the claims of the present invention do not "explicitly require that the power is shut off or restored immediately when the undervoltage/overvoltage and normal conditions are met." Independent Claims of the present invention state that power is restored to the electrical device when the line rms voltage returns to within the predetermined voltage range. As such, when the line rms voltage returns to within the predetermined voltage range is the only condition for restoring power and that a time delay of several minutes is another condition for the restoration of power described in Bello. "Immediately" is not used in the claims, nor the specification. Additionally, the Office Action prescribes a definition of "immediately" that would require a violation of the basic laws of physics, in that the use of "immediately" in the Office action does not include the time delays of physical laws that are inherent in devices operating in the physical world.

Bello describes an electrical load protection device that includes a window comparator circuit, which monitors the level of the line voltage supply. When the magnitude of the line voltage deviates by more than approximately 10%, above or below, from a nominal and selectable value, a regenerative delay circuit is activated. The output of the delay circuit interrupts power to the electrical load. Power is kept off the load for a period of several minutes, even if the line voltage returns to a normal value as long as C5 is discharging through R17, R18 and R19 even in the event of the under-voltage condition correcting itself after a brief occurrence.

Claim 1 recites a method for protecting an electrical device, the method comprising the steps of "monitoring a line rms voltage to detect a high voltage condition such that the rms voltage is above a predetermined voltage range...monitoring the line rms voltage to detect a low voltage condition such that the rms voltage is below the predetermined range...electrically isolating the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is

detected...restoring power to the electrical device when the line rms voltage returns to within the predetermined voltage range."

Bello does not describe or suggest a method for protecting an electrical device wherein the method comprises monitoring a line rms voltage to detect a high voltage condition such that the rms voltage is above a predetermined voltage range, monitoring the line rms voltage to detect a low voltage condition such that the rms voltage is below the predetermined range, electrically isolating the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected, restoring power to the electrical device when the line rms voltage returns to within the predetermined voltage range. Specifically Bello does not describe or suggest restoring power to the electrical device when the line rms voltage returns to within the predetermined voltage range. Rather, in contrast to the present invention, Bello describes at column 2, lines 21-23, "the power is kept off the load for a period of several minutes, even if the line voltage returns to a normal value." At column 3, line 67 through column 4, line 3, Bello also recites, "regenerative action through CR3 keeps Q4 in a non-conducting state for as long as C5 is discharging through R17, R18, and, R19 even in the event of the under-voltage condition correcting itself after a brief occurrence. " Q4 in a non-conducting state stops "the flow of current through bridge B1 and the coil of RY1 which cuts power to the load." Therefore Bello does not describe or suggest restoring power to the electrical device when the line rms voltage returns to within the predetermined voltage range, but rather Bello describes two conditions required to be met before power is restored to the device, namely the line voltage returns to a normal value and a time delay of several minutes. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Bello.

Claims 2-9 depend from independent Claim 1. When the recitations of Claims 2-9 are considered in combination with the recitations of Claim 1, Applicant submits that dependent Claims 2-9 likewise are patentable over Bello.

Claim 10 recites a controller circuit for protecting an electrical device wherein the controller circuit includes an integrated circuit coupled to a relay, and the controller circuit includes "a circuit configured to monitor a line rms voltage to detect a rms voltage above a predetermined voltage range...a circuit configured to monitor the line rms voltage to detect a rms voltage below the predetermined range...a circuit configured to electrically isolate the electrical device such that the electrical device does not receive electricity when at least one

of a rms voltage above the predetermined voltage range and a rms voltage below the predetermined range is detected...a circuit configured to restore power to the electrical device when the line rms voltage returns to within the predetermined voltage range."

Bello does not describe or suggest a controller circuit for protecting an electrical device wherein the controller circuit includes an integrated circuit coupled to a relay, and the controller circuit includes a circuit configured to monitor a line rms voltage to detect a rms voltage above a predetermined voltage range, a circuit configured to monitor the line rms voltage to detect a rms voltage below the predetermined range, a circuit configured to electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a rms voltage above the predetermined voltage range and a rms voltage below the predetermined range is detected, and a circuit configured to restore power to the electrical device when the line rms voltage returns to within the predetermined voltage range. Specifically, Bello does not describe or suggest a circuit that is configured to restore power to the electrical device when the line rms voltage returns to within the predetermined voltage range. Rather, in contrast to the present invention, Bello describes that the power is kept off the load for a period of several minutes, even if the line voltage returns to a normal value. Accordingly, for at least the reasons set forth above, Claim 10 is submitted to be patentable over Bello.

Claims 11-19 depend from independent Claim 10. When the recitations of Claims 11-19 are considered in combination with the recitations of Claim 10, Applicant submits that dependent Claims 11-19 likewise are patentable over Bello.

Claim 20 recites a circuit for protecting an electrical device wherein the controller circuit includes an integrated circuit coupled to a relay, and the controller circuit includes "a circuit configured to monitor a line rms voltage to detect a high voltage condition such that the voltage is above a predetermined voltage range...a circuit configured to monitor the line rms voltage to detect a low voltage condition such that the voltage is below the predetermined range...a circuit configured to electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected...a circuit configured to monitor the line rms voltage after electrically isolating the electrical device to detect a voltage within the predetermined range...a circuit configured to restore power to the electrical device when the line rms voltage is detected to be within the predetermined voltage range...a circuit

configured to provide a visual indication when a low voltage condition is detected...a circuit configured to provide a visual indication when a high voltage condition is detected...a circuit configured to provide a visual indication when the line voltage is being tested."

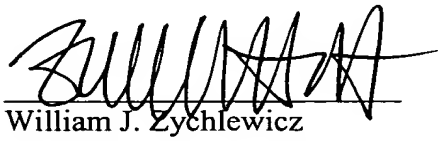
Bello does not describe or suggest a circuit for protecting an electrical device wherein the controller circuit includes an integrated circuit coupled to a relay, and the controller circuit includes a circuit configured to monitor a line rms voltage to detect a high voltage condition such that the voltage is above a predetermined voltage range, a circuit configured to monitor the line rms voltage to detect a low voltage condition such that the voltage is below the predetermined range, a circuit configured to electrically isolate the electrical device such that the electrical device does not receive electricity when at least one of a high voltage condition and a low voltage condition is detected, a circuit configured to monitor the line rms voltage after electrically isolating the electrical device to detect a voltage within the predetermined range, a circuit configured to restore power to the electrical device when the line rms voltage is detected to be within the predetermined voltage range, a circuit configured to provide a visual indication when a low voltage condition is detected, a circuit configured to provide a visual indication when a high voltage condition is detected, and a circuit configured to provide a visual indication when the line voltage is being tested. Moreover, Bello does not describe or suggest a circuit that is configured to restore power to the electrical device when the line rms voltage is detected to be within the predetermined voltage range. Rather, in contrast to the present invention, Bello describes that the power is kept off the load for a period of several minutes, even if the line voltage returns to a normal value. Accordingly, for at least the reasons set forth above, Claim 20 is submitted to be patentable over Bello.

For at least the reasons set forth above, Applicant respectfully requests that the Section 102 rejection of Claims 1, 2, 4-11, and 13-20 be withdrawn.

In view of the foregoing remarks, all the claims now active in the application are believed to be in condition for allowance. Favorable action is respectfully solicited.

In view of the foregoing remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully submitted,



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